

BUSHFIRE ASSESSMENT REPORT

PROPOSED SCHOOL ALTERNATE SOLUTION

**LOT 412 and 413 DP 1063902
507 Medowie Road, Medowie**

Date: **26/3/2018**

Prepared for: **Catherine McAuley Catholic College**

NEWCASTLE BUSHFIRE CONSULTING

5 Chartley Street, Warners Bay NSW 2282
(Ph) 02 40230149 (mob) 0423 923284
Email: mail@newcastlebushfire.com.au

Couch Family Trust T/A
Newcastle Bushfire Consulting Pty Ltd A.B.N. 96 831 374 298
Bushfire and Building Sustainability Consultants

Document Status

Revision No.	Issue	Description	Reviewed	Approved by Director
1	27/11/2017	Draft	M. Hamilton	P.Couch
2	30/11/2017	Draft Rev A – corrected supporting plans and photographs.	M. Hamilton	P.Couch
3	12/3/2018	Final	M. Hamilton	P.Couch
4	15/3/2018	Rev A – altered reference to underground electrical transmission lines where onsite.	M. Hamilton	P.Couch
5	26/3/2018	Rev B – rewording to underground electrical transmission lines servicing the buildings within the school.	M. Hamilton	P.Couch
6	4/4/2018	Rev C – preparation of alternate solution examining outer protection area for forested wetland to reduce ecological impact.	M. Hamilton	P.Couch

Prepared By:



Phillip Couch GFireE
Bach Info Science
Grad Dip Design for Bushfire Prone Areas
FPAA BPAD – Level 3 Accreditation Number BPD-PA-16132
Director Newcastle Bushfire Consulting



TABLE OF CONTENTS

1.0 EXECUTIVE SUMMARY AND COMPLIANCE TABLES	4
2.0 INTRODUCTION	6
2.1 PURPOSE OF REPORT	6
2.2 PROPOSED DEVELOPMENT	6
2.3 SIGNIFICANT ENVIRONMENTAL FEATURES	6
2.4 ENVIRONMENTAL ASSETS	6
2.5 ABORIGINAL HERITAGE	6
3.0 BUSHFIRE ATTACK ASSESSMENT	9
3.1 VEGETATION CLASSIFICATION	9
3.2 EFFECTIVE SLOPE	9
3.3 MINIMUM SETBACKS AND ASSET PROTECTION ZONES	9
3.4 BUSHFIRE ATTACK LEVELS	9
4.0 UTILITY SERVICES AND INFRASTRUCTURE	12
4.1 WATER SERVICES	12
4.2 ELECTRICITY SERVICES	12
4.3 GAS SERVICES	12
5.0 PROPERTY ACCESS	12
6.0 LANDSCAPING MAINTENANCE	14
7.0 EMERGENCY AND MAINTENANCE PLANS	14
7.1 BUSHFIRE MAINTENANCE PLANS	14
7.2 FIRE EMERGENCY PROCEDURES	15
8.0 ALTERNATE SOLUTION	15
9.0 RECOMMENDATIONS	18
10.0 CONCLUSION	18
11.0 APPENDIX 1.0 – ASSET PROTECTION ZONES SUMMARY	19
12.0 REFERENCES AND DISCLAIMER	20

LIST OF TABLES

TABLE 1 – PROPERTY DETAILS AND TYPE OF PROPOSAL	4
TABLE 2 – BUSHFIRE THREAT ASSESSMENT	4
TABLE 3 – PLANNING FOR BUSHFIRE PROTECTION (2006) 4.2.7 COMPLIANCE	5

LIST OF FIGURES

FIGURE 1 – SITE CONSTRAINTS MAP	8
FIGURE 2 – LOCALITY MAP	10
FIGURE 3 – SITE PLAN	11

LIST OF PHOTOGRAPHS

PHOTOGRAPH 1 – SITE PHOTO	7
PHOTOGRAPH 2 – SOUTHERN VEGETATIVE THREAT	7
PHOTOGRAPH 3 – WESTERN REMNANT WOODLAND	10

1.0 EXECUTIVE SUMMARY AND COMPLIANCE TABLES

This report has assessed the proposed school against the requirements of s100B of the *Rural Fires Act 1997*, AS3959 (2009) Building in Bushfire Prone Areas and Planning for Bushfire Protection, 2006.

This report establishes that the school is capable of complying with the acceptable solutions of Planning for Bushfire Protection 2006.

TABLE 1 – PROPERTY DETAILS AND TYPE OF PROPOSAL

Applicant Name	Catherine McAuley Catholic College		
Site Address	507 Medowie Road, Medowie	Lot/Sec/DP	Lot 412 and 413 DP 1063902
Local Government Area	Port Stephens	FDI	100
Bushfire Prone Land	Yes – within the 100 metre buffer of a Category 1 Vegetation		
Type of development	School	Type of Area	Rural Residential
Special Fire Protection Purpose	Yes	Flame Temperature	1200K
Application Complies with DTS Provisions	No. Alternate solution proposes outer protection area for forested wetland to reduce ecological impact	Referral to RFS required	Yes. Bushfire Safety Authority Required

TABLE 2 – BUSHFIRE THREAT ASSESSMENT

	North	East	South	West
AS3959 (2009) Vegetation Structure	Forest	Remnant Vegetation < 50 metre fire run towards buildings	Forested Wetland	Remnant Vegetation < 50 metre fire run towards buildings
Asset Protection Zone	130 metres	87 metres	50 metres	50 metres
Accurate Slope Measure	1 degree downslope	Level	Level	1 degree downslope
Slope Range	1 to 5 degrees downslope	Level/Upslope	Level/Upslope	1 to 5 degrees downslope
PBP (2006) Table A2.6 Minimum Setbacks	60 metres	30 metres	50 metres	40 metres
AS3959 (2009) Bushfire Attack Level (BAL)	BAL-LOW	BAL-12.5	BAL-12.5	BAL-12.5

TABLE 3 – PLANNING FOR BUSHFIRE PROTECTION (2006) 4.2.7 COMPLIANCE

Performance Criteria	Proposed Development Determinations	Method of Assessment
Asset Protection Zone	<p>Minimum setbacks have been determined in accordance with Planning for Bushfire Protection (2006) Table A2.6 and are able to be achieved within the subject site and neighbouring road reserve considered equivalent to an Asset Protection Zone.</p> <p>Construction Asset Protection Zones have been determined in accordance with AS 3959-2009 Method 1 Simplified Procedure.</p> <p>An alternate solution has been proposed considering an outer protection area as a fuel reduced zone to reduce ecological impact on the SEPP 14 wetlands.</p>	<u>Alternate Solution</u>
Access – Internal Roads	The internal access roads are to comply with Planning for Bushfire Protection (2006) Section 4.2.7.	Acceptable Solution
Water Supply	Hydrant network to be installed in accordance with Planning for Bushfire Protection (2006) Section 4.2.7.	Acceptable Solution
Electrical Supply	The electrical transmission lines to the local area are located overhead with landscaping onsite to be managed so that no part of a tree is closer to a power line than the distance set out in accordance with the specifications in 'Vegetation Safety Clearances' issued by Energy Australia (NS179, April 2002). The electrical supply to the school buildings will be located underground.	Acceptable Solution
Gas Supply	Gas supply if installed shall comply with deemed to satisfy requirements.	Acceptable Solution
Emergency and Evacuation Planning	The facility shall have an emergency management plan developed in accordance with AS 3745 'Emergency control organisation and procedures for buildings, structures and workplaces'.	Acceptable Solution

2.0 INTRODUCTION

2.1 PURPOSE OF REPORT

The purpose of this report is to establish suitable bushfire mitigation measures for the proposed school to be constructed at Lot 412 and 413 DP 1063902, 507 Medowie Road, Medowie. The assessment acknowledges the requirements of s100B of the Rural Fires Act 1997 and Planning for Bushfire Protection 2006 to protect persons, property and the environment from danger that may arise from a bushfire.

Under the provisions of section 100B of the Rural Fires Act 1997 as amended, a Bushfire Safety Authority (BFSa) is required from the Commissioner of the NSW Rural Fire Service.

This report complies with Rural Fires Regulation 2008 Clause 44 Application for Bushfire Safety Authority. The assessment encompasses the subject site and neighbouring areas.

The recommendations within this report address the aims and objectives of Planning for Bushfire Protection 2006 to reduce the risk of ignition of the school in a bushfire event.

2.2 PROPOSED DEVELOPMENT

The land is zoned R2 low density residential and RU2 Rural Landscape. The land is comprised of two allotments totalling approximately 26.77 hectares in size. The proposed development includes the construction of a school.

2.3 SIGNIFICANT ENVIRONMENTAL FEATURES

There are no known significant environmental features affecting the site.

2.4 ENVIRONMENTAL ASSETS

The only known environmental asset on the subject site is the SEPP 14 Wetland located south and southwest of the school. The asset protection zone extends a small distance into the wetland with environmental studies having reviewed the impact.

2.5 ABORIGINAL HERITAGE

Searches of National Parks and Wildlife database identify 4 Aboriginal sites are recorded in or near the subject site as defined by National Parks and Wildlife Act 1974.



PHOTOGRAPH 1 – SITE PHOTO

View of the subject site looking north. Significant clearing has already been completed onsite. Mown grass surrounds the existing dwelling and shed.



PHOTOGRAPH 2 – SOUTHERN VEGETATIVE THREAT

View of forested wetland located south of the site. The vegetation shows signs of periodic inundation of water. The vegetation further to the south changes to be shrubland and scrub.

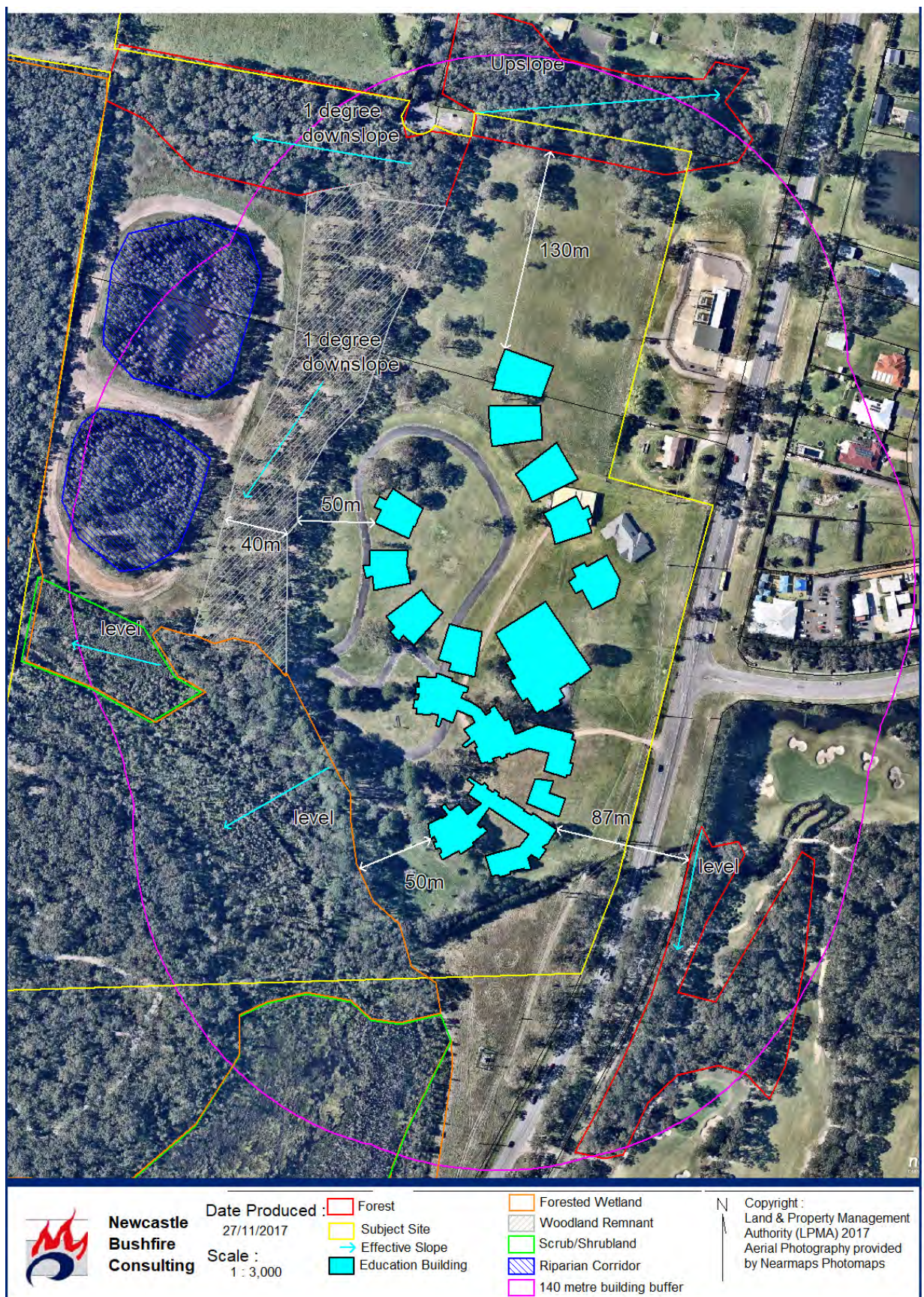


FIGURE 1 – SITE CONSTRAINTS MAP

3.0 BUSHFIRE ATTACK ASSESSMENT

3.1 VEGETATION CLASSIFICATION

Potential bushfire hazards were identified from Port Stephens Council bushfire prone mapping as occurring within the investigation area. Aerial mapping and inspection of the site reveals that the bushfire prone land map is reasonably accurate in respect to the current bushfire hazard.

The major vegetative threats have been determined using Keith (2004) to derive vegetation structures listed in Planning for Bushfire Protection (2006). General vegetation structures have been translated to AS3959 (2009) groupings.

Primary Vegetation Structures have been identified in Figure 1 – Site Constraints Map and separation distances shown in Table 2 – Bushfire Attack Assessment.

3.2 EFFECTIVE SLOPE

Effective slope was measured using 0.5 metre contour data obtained from Department of Lands and verified by a laser hypsometer on site. The laser hypsometer verified slope within the vegetation calculating effective fire run slope from 5 separate measurements in each dominant direction.

Effective Slopes have been identified in Figure 1 – Site Constraints Map and slope ranges are shown in Table 2 – Bushfire Threat Assessment.

3.3 MINIMUM SETBACKS AND ASSET PROTECTION ZONES

Minimum setbacks have been determined in accordance with Table A2.6 (Planning for Bushfire Protection). The minimum Asset Protection Zone has been demonstrated in Section 1 Executive Summary and Compliance Tables.

The required asset protection zone is available entirely within the subject site. Refer to alternate solution for the examination of an outer protection area.

3.4 BUSHFIRE ATTACK LEVELS

Bushfire attack levels and relevant construction levels in accordance with AS3959 (2009) have been demonstrated in Section 1 Executive Summary and Compliance Tables, Table 2 Bushfire Threat Assessment.



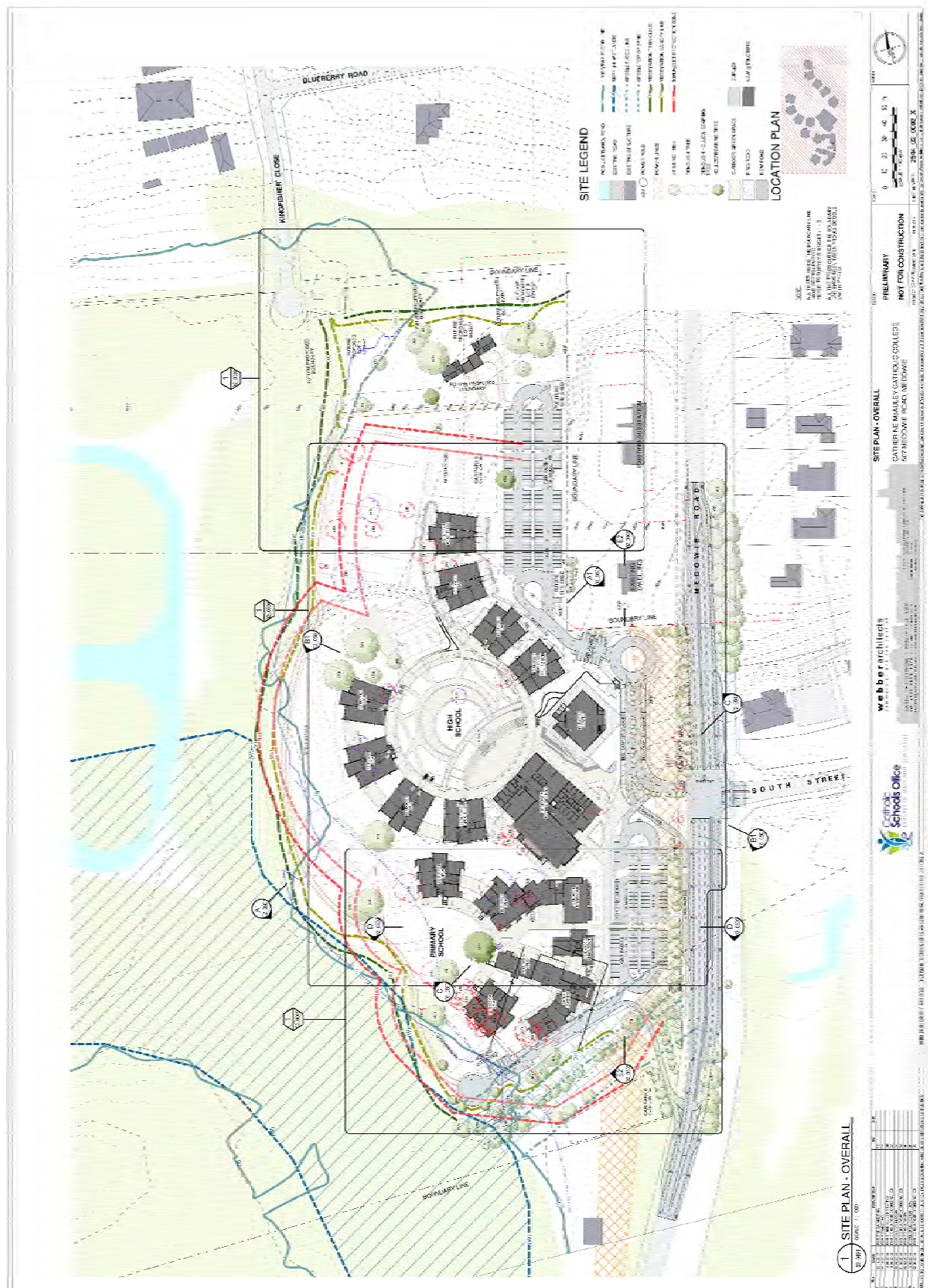
FIGURE 2 – LOCALITY MAP
Courtesy of OpenStreetMap



PHOTOGRAPH 3 – WESTERN REMNANT WOODLAND

View of woodland remnant located west of the proposed school. Eucalypts dominate the upper stratum. The understorey ranges from mown to unmown grass.

FIGURE 3 – SITE PLAN



4.0 UTILITY SERVICES AND INFRASTRUCTURE

4.1 WATER SERVICES

A reticulated water supply and street hydrant access is available in the local street network. A hydrant system shall be designed for the school in accordance with AS 2419.1 – 2005.

4.2 ELECTRICITY SERVICES

The existing electrical supply to the local area is via overhead electrical transmission lines. Landscaping onsite should be managed so that no part of a tree is closer to a power line than the distance set out in accordance with the specifications in 'Vegetation Safety Clearances' issued by Energy Australia (NS179, April 2002).

The subject site is proposed to accommodate up to two electrical kiosk substations where the power supply will connect to the school. The proposed electrical transmission lines servicing the school buildings will be located underground.

4.3 GAS SERVICES

- Reticulated or bottled gas installed and maintained in accordance with AS 1596 -2002 and the requirements of the relevant authorities. Metal piping is to be used.
- Fixed gas cylinders to be kept clear of flammable material by a distance of 10m and shielded on the hazard side of the installation.
- Gas cylinders close to the building are to have the release valves directed away from the building and at least 2m from flammable material with connections to and from the gas cylinder being of metal.
- Polymer sheathed flexible gas supply lines to gas meters adjacent to the buildings are not to be used.

5.0 PROPERTY ACCESS

Public Road Access

The subject site is located on Medowie Road being a dual carriageway road interconnecting into the local road network. Emergency Services are expected to have good access to the area at most times.

The existing Public Road network is deemed adequate to handle increased volumes of traffic in the event of a bush fire emergency. No new public roads are proposed for this development.

Fire Trails

Fire trails do not intersect the vegetation in the local area. A fire trail has been proposed running around the western perimeter of the school to improve access for firefighters to fight fire. The 4 metre wide fire trail will connect to the internal road network of the school, allowing multiple fire trucks to enter and leave the property without turning the vehicle around. It is noted the vegetation adjacent the school to the west north is remnant woodland with a presently mown understorey and a perimeter road is deemed excessive to fight fire in this location. Any firefighting is expected to be more than 100 metres west of the school with access trails presently in place.

Fire trails shall comply with section 4.1.3 of Planning for Bush Fire Protection 2006 as detailed below:

- A minimum carriageway width of four metres with an additional one metre wide strip on each side of the trail (clear of bushes and long grass) is provided.
- The trail is a maximum grade of 15 degrees if sealed and not more than 10 degrees if unsealed.
- A minimum vertical clearance of four metres to any overhanging obstructions, including tree branches is provided.
- The crossfall of the trail is not more than 10 degrees.
- The trail has the capacity for passing by:
 - a passing bay every 200 metres, 20 metres long by three metres wide, making a minimum trafficable width of seven metres at the passing bay.
- The fire trail is accessible to firefighters and maintained in a serviceable condition by the owner of the land.

Property Access

Property access is provided by way of Medowie Road providing access from the public road system directly to the private land giving fire fighters access to the building.

Property access roads shall comply with sections 4.1.3 and 4.2.7 of Planning for Bush Fire Protection 2006 as detailed below:

- Internal roads are two-wheel drive, sealed, all-weather roads.
- Internal perimeter roads are provided with at least two traffic lane widths (carriageway 8 metres minimum kerb to kerb) and shoulders on each side, allowing traffic to pass in opposite directions.
- Roads are through roads. Dead end roads are not more than 100 metres in length from a through road, incorporate a minimum 12 metres outer radius turning circle, and are clearly sign posted as a dead end.
- Traffic management devices are constructed to facilitate access by emergency services vehicles.
- Curves have a minimum inner radius of six metres and are minimal in number to allow for rapid access and egress.

- The minimum distance between inner and outer curves is six metres.
- Maximum grades do not exceed 15 degrees and average grades are not more than 10 degrees.
- Crossfall of the pavement is not more than 10 degrees.
- Roads do not traverse through a wetland or other land potentially subject to periodic inundation (other than flood or storm surge).
- Roads are clearly sign-posted and bridges clearly indicate load ratings.
- The internal road surfaces and bridges have a capacity to carry fully-loaded firefighting vehicles (15 tonnes).

6.0 LANDSCAPING MAINTENANCE

It is recommended that landscaping is undertaken in accordance with Appendix 5 of Planning for Bushfire Protection 2006 and maintained for the life of the development.

Trees should be located greater than 2 metres from any part of the roofline of a building. Garden beds of flammable shrubs are not to be located under trees and should be no closer than 10 metres from an exposed window or door. Trees should have lower limbs removed up to a height of 2 metres above the ground.

The landscaped area should be maintained free of leaf litter and debris. The gutter and roof should be maintained free of leaf litter and debris.

Landscaping should be managed so that flammable vegetation is not located directly under windows.

Ground fuels such as fallen leaves, twigs (less than 6mm in diameter) and branches should be removed on a regular basis, and grass needs to be kept closely mown and where possible green.

7.0 EMERGENCY AND MAINTENANCE PLANS

7.1 BUSHFIRE MAINTENANCE PLANS

A fire management plan is to be prepared that addresses the following requirements:

- a) Contact person / department and details; and
- b) Schedule and description of works for the construction of asset protection zones and their continued maintenance.

- c) Landscaping shall be managed as outlined within section 4.1.3 and Appendix 5 of Planning for Bush Fire Protection 2006 and the NSW Rural Fire Service's document Standards for asset protection zones.

7.2 FIRE EMERGENCY PROCEDURES

Arrangements for emergency and evacuation are to comply with section 4.2.7 of Planning for Bush Fire Protection 2006.

An Emergency /Evacuation Plan is to be prepared consistent with AS 3745 'Emergency control organisation and procedures for buildings, structures and workplaces' and consider bushfire.

8.0 ALTERNATE SOLUTION

At the request of the client I have been asked to provide an unbiased safety model for the proposed development. The proposed alternate solution offers compliance with the National Construction Code 2016 performance measure of reducing the chance of ignition to the building from the firefront and the objectives of Planning for Bushfire Protection (2006).

Proposed Alternate Solution

The proposed alternate solution examines the potential of an outer protection area for forested wetland in a similar manner to the outer protection area proposed in a forest for special fire protection purpose developments. This is proposed due to the asset protection zone entering a SEPP14 wetland area and the intention to reduce the ecological impact created by the asset protection zone.

The proposed alternate solution will establish the asset protection zone required to ensure that a firefighter evacuating a resident from any building will be exposed to less than 10kW/m² radiant heat.

The basis for the assessment of compliance for this site is Planning for Bushfire Protection 2006 Section 4.2.7 Standards for Bush Fire Protection Measures for Special Fire Protection Purpose Developments.

The specific performance criteria measure is compliance with Planning for Bushfire Protection 2006 Asset Protection Zones. The acceptable solutions are identified as:

- 1) an APZ is provided in accordance with the relevant tables and figures in Appendix 2 of this document.
- 2) exits are located away from the hazard side of the building.
- 3) the APZ is wholly within the boundaries of the development site.

The primary focus of this alternate solution is the compliance with acceptable solution 1 as items 2 and 3 are complied with.

Planning for Bushfire Protection 2006 Appendix 3 (amended May 2010) Section A3.3 Compliance Approaches and A3.4 Alternative Solution Approach to Site Assessment: Radiant Heat Flux and Required Separation Distances, outline the performance criteria for alternate solutions.

Asset Protection Zone Performance Criteria

“radiant heat levels of greater than 10kW/m² will not be experienced by occupants or emergency services workers entering or exiting a building.”

An asset protection zone shall be provided in accordance with Planning for Bushfire Protection Table A2.6 with the consideration of Table A2.7 examined to provide an Outer Protection Area.

Table A2.7 provides outer protection areas for forest vegetation with the outer protection area based on a parallel assessment of woodland fuel loadings within the outer protection area as a fuel reduced zone and the inner protection area defined as 10 kw/m² radiant heat exposure from woodland vegetation.

A 20 metre outer protection area is detailed for forest vegetation applied to special fire protection purpose developments.

This translates to a 10 metre outer protection area for forested wetland environment where the overall asset protection zone is 10 metres less than forest.

Evaluation of Alternate Solutions

Planning for Bushfire Protection (2006) details the deemed to satisfy conditions for special fire protection purpose with the provision of the outer protection area being an extrapolation of existing accepted legislation. The reduced ecological impact of establishing a 10 metre outer protection area in place of inner protection area should be considered due to the SEPP14 wetland.

All of the proposed buildings are built in a location where a person could be evacuated to less than 10 kw/m² radiant heat exposure.

It is deemed very unlikely that a firefighter would evacuate a building user directly towards the bushland and if a fire was impacting on the buildings the 10 kw/m² radiant heat exposure would be likely to last for 30 seconds or less.

Compliance with National Construction Code 2016

The combination of building recommendations, fire resistant design, maintenance of landscaping/asset protection zones and acknowledgment of risk achieves the performance requirements of the National Construction Code 2016.

National Construction Code 2016 P2.3.4 Bushfire areas

A Class 1 building or a Class 10a building or deck associated with a Class 1 building that is constructed in a designated bushfire prone area must, to the degree necessary, be designed and constructed to reduce the risk of ignition from a bushfire, appropriate to the—

- a. potential for ignition caused by burning embers, radiant heat or flame generated by a bushfire; and
- b. intensity of the bushfire attack on the building.

In this regard the radiant heat flux established within the alternate solution will identify the construction requirements in accordance with AS 3959-2009 and Addendum to Appendix 3 Planning for Bushfire Protection 2006. Ember protection is considered and will be addressed by complying with AS 3959 2009 for the relevant Bushfire Attack Level (BAL).

Bushfire Certification

In accordance with NSW RFS Alternate Solutions Practice Note 1/07 (Release 3), this report has been prepared by Phillip Couch, a Fire Protection Association, Bushfire Planning and Design - Alternate Solutions certified practitioner (FPAA BPAD-Level 3) and a Graduate Fire Engineer with the Institution of Fire Engineers. Phillip Couch certifies that the described Bushfire Behaviour is the expected fire behaviour for the adjacent vegetation and the design complies with the Performance Criteria of Planning for Bushfire Protection.



Phillip Couch GFireE

Bach Info Science

Grad Dip Design for Bushfire Prone Areas

FPAA BPAD – Level 3 Certificate Number BPD-PA-16132

9.0 RECOMMENDATIONS

Based upon an assessment of the plans and information received for the proposal, it is recommended that development consent be granted subject to the following conditions:

1. The proposed building works shall comply with BAL-12.5 in accordance with AS 3959-2009 Building in Bushfire Prone Areas and the construction requirements of Planning for Bushfire Protection 2006 Appendix 3 (amended May 2010).
2. At the commencement of building works and in perpetuity a minimum 50 metre asset protection zone shall be managed as outlined within section 4.1.3 and Appendix 5 of Planning for Bush Fire Protection 2006 and the NSW Rural Fire Service's document Standards for asset protection zones. The asset protection zone shall be divided into the below components:
 - a. Inner Protection Area – 40 metres
 - b. Outer Protection Area – 10 metres
3. Water, electricity and gas are to comply with section 4.2.7 of Planning for Bush Fire Protection 2006.
4. The property access is to comply with section 4.2.7 of Planning for Bush Fire Protection 2006.
5. Landscaping is to be undertaken in accordance with Appendix 5 of Planning for Bushfire Protection 2006 and managed and maintained in perpetuity.
6. An Emergency /Evacuation Plan is to be prepared consistent with AS 3745 'Emergency control organisation and procedures for buildings, structures and workplaces' and consider bushfire.

10.0 CONCLUSION

The final recommendation is that there is buildable area onsite for the development with appropriate services and asset protection zones available. The proposed development can comply with the requirements of Planning for Bushfire Protection 2006 guidelines as required under section 100b of the Rural Fires Act 1997. This report should be referred to NSW Rural Fire Service for the issue of a Bushfire Safety Authority.

11.0 APPENDIX 1.0 – ASSET PROTECTION ZONES SUMMARY

Below is a summary of Asset Protection Zones outlined in Appendix 5 of Planning for Bushfire Protection (2006) and the NSW Rural Fire Services “Standards for Asset Protection Zones”. The property owner should obtain these two documents and familiarise themselves with their content.

Generally

Asset Protection Zones (APZ) refers to the area between the bushfire threat and the asset (i.e. building). The APZ may contain two areas; the Inner Protection Area (IPA) and the Outer Protection Area (OPA). Some areas should be managed entirely as an Inner Protection Area (IPA). Refer to the plans for locations of APZ and distances from Assets.

Inner Protection Area (IPA)

The inner protection area is located adjacent to the asset and is identified as a fuel free zone.

A. Shrubs (consisting of plants that are not considered to be trees)

1. Shrubs must be located away from a buildings glazing and vent openings.
2. Avoid planting around entry ways if the vegetation is flammable.
3. A maximum 30% of the Inner Protection Area may contain shrubs.
4. A minimum 1.5 metre separation of shrubby vegetation from the building shall be maintained.
5. Shrubs must not have a connection with the tree canopy layer; remove/trim shrubs or underprune trees.
6. Ensure turf is suitably mown and/or grasslands are continually slashed to restrict to max 100mm high.

B. Trees: Maintain a minimum 2-5 metre canopy separation.

1. Trees are allowed in the inner protection area however they should not touch or overhang buildings. No tree should be within 2 metres of the roofline.
2. Underprune branches between the shrub layer and the canopy layer.
3. Ensure branches do not overhang buildings.
4. Ensure all trees in the IPA within 3 metres of buildings do not provide a serious fire threat.
5. Trees should have lower limbs removed up to a height of 2 metres above the ground.

Outer Protection Area (OPA)

The Outer Protection Area (OPA) is located adjoining vegetation threat. The OPA should be maintained as a fuel reduced area. This assumes trees may remain but with a significantly reduced shrub, grass, and leaf litter layer. In many situations leaf litter and the shrub layer may not require maintenance at all.

A. Shrubs:

1. Reduce or trim large stands of shrubs

B. Trees:

1. Existing trees can be retained.
2. Ensure a separation is available between shrubs and tree canopy.
3. Reduce tree canopy so there is no interlocking canopy.

12.0 REFERENCES AND DISCLAIMER

References

Standards Australia (2009) AS3959 Construction of Buildings in Bushfire-Prone Areas

Keith D. (2004) "Ocean Shores to Desert Dunes", Department of Environment and Conservation, Sydney.

Environmental Planning and Assessment Act (1979)

New South Wales Rural Fire Service (2006) Planning for Bushfire Protection

New South Wales Rural Fire Service (2010) Planning for Bushfire Protection Appendix 3 Amendment

Rural Fires Act (1997)

Rural Fire Regulation (2008)

Disclaimer

Despite the recommendations in this report, it is impossible to remove the risk of fire damage to the building entirely. This report assesses and provides recommendations to reduce that risk to a manageable level. It is of paramount importance that the recommendations are adhered to for the life of the structure and that all maintenance is performed, to ensure a level of protection is provided to the building, occupants and fire fighters.

Planning for Bushfire Protection (2006) states that notwithstanding the precautions adopted, it should always be remembered that bushfires burn under a wide range of conditions and an element of risk, no matter how small always remains.

AS3959 (2009) Building in Bushfire Prone Areas states that the standard is designed to lessen the risk of damage to buildings occurring in the event of the onslaught of bushfire. There can be no guarantee, because of the variable nature of bushfires, that any one building will withstand bushfire attack on every occasion.